REMARKS

Claim 1 has been amended to specify that the A groups are a mixture of A1, A2, A3 and A4 groups in specified proportions (with up to specified amounts of A4 and A5 groups), and that the A groups contain an average of from 0.95 to 1.20 $-CH_2O-$ groups per A group. These limitations are found on page 5 of the specification, at lines 23-25, 27-28, and 29-31. The hydroxyl equivalent weight of the hydroxymethyl-containing polyol is now specified as being at least 650, as supported at page 3 line 3 of the specification. An inconsistency has also been removed from the claim.

Regarding the §103(a) rejection

The examiner is requested to reconsider this rejection in view of the amendments to the claims.

The claim as now amended specifies that the polyester polyol contains A1, A2, A3 and A4 groups, and that it may also contain A5 groups. The proportions of these groups are specified, as is the average "functionality" of the A groups. The average "functionality" (i.e., the number of $-CH_2O-$ groups per A group) is from 0.95 to 1.20; as explained on pages 5-6 of the specification, this allows the functionality of the polyester polyol to be controlled to nearly that of the initiator compound that is used to make it (the R group in structure I). This allows for control over the amount of branching in the polyester polyol, which is important for making polyurethane foams that have acceptable properties. Polyester polyols according to structure I of applicants' claim, which in which the proportions of A1, A2, A3 and A4 are different, and the average number of $-CH_2O-$ are outside of the range of 0.95 to 1.20, tend to be difficult to process into polyurethane foams having acceptable properties.

The Cobb reference, USP 5,981,613 does not describe any polyurethane foam made using any hydroxymethyl-containing polyester polyol as described in applicants' claims, or anything remotely similar to those polyols.

The Peerman reference, USP 4,423,162, describes polyurethanes made from certain hydroxymethyl-containing polyester polyols. Nonetheless, Peerman differs from the invention as now claimed in several important respects:

A) Peerman does not describe any hydroxymethyl-containing polyester polyols that contain A3 groups as required in the present claims. Note that Peerman describes groups that he calls "A3", but his "A3" groups are different than applicants'. (Peerman's "A3" groups are gem-substituted dihydroxymethyl compounds, whereas applicants' "A3" groups are tris(hydroxymethyl) compounds.) Peerman states that A3 groups of applicants' type are not made in his synthetic process (see column 4 lines 60-65); therefore Peerman's polyester polyols cannot contain applicants' A3 groups.

B) Peerman does not describe any hydroxymethyl-containing polyester polyols that contain A1, A2, A3 and A4 groups in the ratios specified by the applicants.

C) Peerman does not describe, nor recognize the significance, of controlling the average "functionality" of the A group, i.e. average number of $-CH_2O-$ groups/A group, in making water-blown polyurethane foam.

D) Peerman describes no water-blown polyurethane foams of any kind. Peerman therefore cannot be relied upon as showing that his hydroxymethyl-containing polyester polyols are useful at all in preparing water-blown polyurethane foams. Peerman also fails to describe which, if any, among his hydroxymethyl-containing polyester polyols would be useful in preparing water-blown polyurethane foams. All Peerman actually demonstrates is that low equivalent weight hydroxymethyl-containing polyols (Peerman's highest actual equivalent weight appears to be only 446 (Example 2)) can be reacted with isocyanate and chain extender in the absence of blowing agent to form a non-cellular polymer.

This last point is especially significant. Peerman provides no information at all about whether Peerman's hydroxymethyl-containing polyols could be used to successfully produce flexible polyurethane foams as in applicants' invention. As the examiner is no doubt aware, the chemistry of water-blown foams is vastly different and more complex than that of the simple systems described in Peerman. A successful foaming process involves competition between the polyol and water for isocyanate groups, the formation of urea bonds due the reaction of water and isocyanate groups, a proper sequencing between the various reactions and other factors that are not present in Peerman's simple polyurethane reactions. There is no basis in Peerman for one to have any reasonable expectation that hydroxymethyl-containing polyols might be used successfully in Cobb's water-blown polyurethane foam systems.

Cobb does not contain the necessary teachings, either. Cobb describes only well-known polyether polyols and polyesters that are made from diols and dicarboxylic acids and

do no contain hydroxymethyl groups. There is nothing in Cobb to suggest that any other type of polyol, such as Peerman's or any other hydroxymethyl-containing polyester polyol, could be used successfully. And, even if there were some teaching in the references suggesting to use Peerman's polyols in Cobb's process (which there is not), then the fact remains that the hydroxymethyl-containing polyols of applicants' claims are still not described in Peerman. Therefore, the combination of the references does not lead to the present invention.

Respectfully submitted,
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